

REMARKS

The Applicants request re-entry of the present application into prosecution by filing of the accompanying RCE and present reply. This reply is in regards to the Final Office Action mailed August 31, 2009, which has been carefully considered. Within the Office Action Claims 1-11, 13 and 14 have been rejected. The Applicants have amended Claims 1 and 13 and have added new Claims 16-19. No new matter has been added. Reconsideration in view of the following remarks is respectfully requested.

Amendments to the Specification and the Drawings

Applicants have amended the specification to be in conformance with the originally filed drawings. In particular, the Applicants have amended the specification to point out the top and bottom surfaces of the grid, and clarify that the grid includes uniformly spaced holes which have the same width dimensions. This is expressly supported by the illustrated grid in Figures 1A-1C as well as Figures 2A and 2B. Additionally, Figure 1A has been amended to point out that the holes 3A, 3B in the grid have a smaller width dimension than the corresponding width dimensions of respective recesses 8A and 8B in the substrate. Entry of the amendments is respectfully requested.

The 35 U.S.C. § 112, First Paragraph Rejection

Claims 1-11, 13 and 14 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was allegedly not described in the specification in such a way as to enable one of ordinary skill in the art to practice the invention. This rejection is respectfully traversed. To expedite prosecution, Claims 1 and 13 have been amended to remove “glue droplets” and “glue film.” However, Applicants have added new claim 17 which recites glue

droplets. Applicants would like to point out that Figure 2A and the accompanying portion of the specification at least on Page 11, Lines 6-25 explicitly describes glue droplets. Accordingly, although the point is moot with respect to Claims 1 and 13, the argument raised in the office action is incorrect as the specification fully describes glue droplets. Withdrawal of the rejection is respectfully requested.

The 35 U.S.C. § 112, Second Paragraph Rejection

Claims 1-11, 13 and 14 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter in the claims. This rejection is respectfully traversed.

With regard to the rejection of the phrase in Claim 1 that “this grid is coated with an array of glue droplets each having a dimension substantially equal to a width dimension of a smallest recess,” the Applicants have amended Claim 1. Withdrawal of the rejection to Claim 1 in light of the amendment is respectfully requested.

With regard to the rejection in Claim 13, “placing an array of glue droplets on a mask-less grid, wherein a dimension of each glue drop let is substantially equal to a width dimension of the recess,” the Applicants have amended Claim 13. Withdrawal of the rejection to Claim 13 in light of the amendment is respectfully requested.

First Rejection under 35 U.S.C. § 103

Claims 1-4 and 10, 11, 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent Application Publication No. 2003/0017305 to Roitman et al. (hereinafter “Roitman”) in view of U.S. Patent Application Publication No. 2004/0020595 to Khan et al. (hereinafter “Khan”), U.S. Patent No. 6,251,219 to Chen et al. (hereinafter

“Chen”) or Japanese Patent Publication No. 2000-71422 to Watanabe et al. (hereinafter “Watanabe”). This rejection is respectfully traversed.

In particular, it is stated in the office action that Roitman discloses the use of screen printing, and that it would have been obvious to combine Roitman with the screen printing techniques in the other cited references in reaching the claimed subject matter. The Applicants respectfully disagree.

In determining obviousness four factual inquiries must be looked into in regards to determining obviousness. These are determining the scope and content of the prior art; ascertaining the differences between the prior art and the claims in issue; resolving the level of ordinary skill in the pertinent art; and evaluating evidence of secondary consideration. Graham v. John Deere, 383 U.S. 1 (1966); KSR Int’l Co. v. Teleflex, Inc., No 04-1350 (U.S. Apr. 30, 2007) (“ Often, it will be necessary . . . to look into related teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an **apparent reason** to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis **should be made explicit.**”) (emphasis added).

Applicants’ specification is directed to a method which ensures that glue can be applied to any substrate without the need of a stencil or mask. As known in the art, stencils or masks are used in or in conjunction with a grid, whereby the stenciled portions of the grid do not allow glue to pass therethrough. Therefore, any grid that is to be applied to a substrate must be stenciled to that particular substrate, whereby the grid becomes unusable for another substrate which has a different design. This makes manufacturing for different designed substrates expensive, since each different substrate effectively requires a customized stenciled grid. Furthermore,

considering the dimensions of the recesses may be in the order of 50 microns, alignment of a masked grid with the substrate is extremely important. The present method, by using a mask less or non-stenciled grid, overcomes these disadvantages. However, using a mask-less grid with a substrate having such small recesses presents other challenges, such as preventing glue that is deposited onto the substrate from entering any of the substrate's recesses.

Applicant's method solves the above problems/disadvantages by configuring the holes of the mask-less grid to have cross-sectional dimensions which are not larger than that of the smallest recess in the substrate. Upon the glue being pressed against the grid, glue enters the hole, but is held within the hole due to friction forces between the walls of the grid's holes and the glue. Thus, the glue will remain in the hole until the bottom surface of the grid, at the hole, comes into contact with a below surface, because surface tension forces from the surface below the grid overcomes the friction forces within the grid's hole. By configuring the holes to be no larger than the size of the smallest recess, no surface tension will be applied to any hole that is positioned over a recess since the hole is will not be in contact with a surface. Accordingly, only portions of the grid which come into contact with the substrate (i.e. the upper coplanar plane areas) will be applied the sufficient surface tension to allow the glue to pass through onto the substrate.

Roitman

Roitman discusses that in certain embodiments a solvent-resistant adhesive is applied to one or both of the substrates which are attached to one another. In addition, Roitman merely describes in general terms that screen printing can be used to apply adhesive to the substrate.

Khan

Khan describes the use of a method of making a multi-well plate for assaying liquid samples. Khan discloses that the grid screen 30 is a masked screen (i.e. screen that includes a stencil), whereby the screen 30 places a stencil of the walls 14,16 of the upper frame 12. In particular to Figures 4-6, Khan discloses that as the squeegee 34 is moved across screen 30, it pushes screen 30 against glass panel 20 with line contact as shown in FIG. 5. This squeezes adhesive 22 through apertures 32 leaving a **grid pattern** of adhesive on glass panel 20 as shown in FIG. 6. This **pattern** of adhesive includes **intersecting lines of adhesive** 22a, 22b **corresponding respectively to intersecting walls 14, 16** and a **surrounding line of adhesive** 22c for sealing around the outer periphery of glass panel 20 and a corresponding periphery upper frame portion 12. (emphasis added). This is further supported in Figure 7 where the glass panel 20 is shown to have the adhesive in the grid pattern such that the outer periphery 22c as well as the intersecting lines 22a, 22b of adhesive match up exactly with the respective outer periphery and intersecting walls 14, 16 of the grid pattern in the upper frame 12. (Khan, Paragraph 0021; Figures 4-7) (emphasis added). Thus, Khan does not teach a grid with uniformly placed holes. Also, Khan does not disclose that all the holes are around the size of the smallest recess.

Ringleben

Regarding Ringleben, Ringleben cannot be used in a 35 U.S.C. 103 analysis as it is not considered prior art under 35 U.S.C. 102. Ringleben has a filing date of February 11, 2004, whereas the present application claims priority to French foreign application 03/50218 filed June 16, 2003. Applicants have included a certified statement that the present application is an accurate translation of the priority application. Accordingly, the filing date of the present application predates that of Ringleben and thus, Ringleben cannot be used as prior art.

Chen

Chen discloses a method for assembling electronic devices. In particular, Chen expressly states that in a screen printing process, a screen that is generally impermeable to adhesive has adhesive placed on it. The screen includes a **pattern of holes** formed on it, and these holes **correspond to desired locations of circuit components** on the substrate. (Chen, Col. 1, Lines 25-37). In addition, Chen expressly teaches away from using screen pattern techniques in stating that although screen printing works well on flat substrates, screen printing “does not work well on multi-level substrates or substrates that include ridges or cavities.” In fact, “[o]n substrates with such surface irregularities, it is difficult for the screen to remain in contact with the substrate as the squeegee passes over the screen. As a result, the adhesive may not be properly transferred from the screen to the substrate. (Chen, Col. 1, Lines 38-48). Considering that Chen teaches away from the claimed embodiments as well as the cited references, one skilled in the art would not have the motivation to use Chen in reaching the claimed embodiments.

Watanabe

Watanabe discloses a screen 24 having an opening in contact with an upper surface 6, whereby adhesive agent is applied to the surface 6 to allow substrates 10 and 5 to be placed thereon. One skilled in the art would not use Watanabe in reaching the claimed subject matter as Watanabe merely teaches applying the adhesive through an opening in the screen 24 and then removing the screen to leave the adhesive at the point of the opening. However, there is no teaching or suggestion of recesses, as specified in Claims 1 and 13, and thus no motivation to one skilled in the art to use a mask-less grid to prevent glue from entering recesses. For at least these reasons, one skilled in the art would not use Watanabe with any of the other cited references in reaching the claimed subject matter.

No motivation to combine references

One skilled in the art would not utilize Roitman in attempting to solve the problem that Applicant's method solves. In particular, one skilled in the art would realize that Roitman does not seek to resolve the problem of preventing glue from entering the recesses in the substrate considering that Roitman mentions that other possible ways of applying the adhesive include "spraying," "dip-coating," and "brushing." These methods mentioned in Roitman certainly do not prevent glue from entering the recesses. Therefore, Roitman does not teach or suggest a mask-less grid that prevents glue from entering the recesses, as claimed in Claims 1 and 13. It should be noted that the office action has not provided any **apparent reason** besides the mere mention of "screen printing" in Roitman to establishing motivation to use a mask-less grid. See KSR.

In addition, one skilled in the art would not be motivated to combine Roitman with Khan in reaching the claimed subject matter in Claims 1 and 13 to satisfy a proper obviousness rejection. Khan effectively admits using a screen 30 having apertures 32 in a grid pattern which is in contact with the upper frame portion 12. (Khan, Paragraph 0020). In other words, the screen 30 with grid pattern in Khan is considered a masked grid. In particular, Khan discloses that as the squeegee 34 is moved across screen 30, it pushes screen 30 against glass panel 20 with line contact as shown in FIG. 5. This squeezes adhesive 22 through apertures 32 leaving a grid **pattern** of adhesive on glass panel 20 as shown in FIG. 6. This pattern of adhesive includes intersecting lines of adhesive 22a, 22b corresponding respectively to intersecting walls 14, 16 and a surrounding line of adhesive 22c for sealing around the outer periphery of glass panel 20 and a corresponding periphery upper frame portion 12. One skilled in the art would not combine

Roitman with Khan in reaching the claimed subject matter. Accordingly, Claims 1 and 13 is patentable over the combination of Roitman and Khan.

One skilled in the art would not combine Roitman with Chen in reaching the claimed subject matter. As stated above, Chen expressly teaches away from using screen pattern techniques in stating that although screen printing works well on flat substrates, screen printing “does not work well on multi-level substrates or substrates that include ridges or cavities.” In fact, “[o]n substrates with such surface irregularities, it is difficult for the screen to remain in contact with the substrate as the squeegee passes over the screen. As a result, the adhesive may not be properly transferred from the screen to the substrate. (Chen, Col. 1, Lines 38-48). One skilled in the art reading Chen would not be motivated to use this reference as it teaches away from the use of screen printing on a substrate having recesses. For at least these reasons, one skilled in the art would not have any apparent reason to combine Roitman with Chen in reaching the claimed subject matter in Claims 1 and 13. Accordingly, withdrawal of the rejection is respectfully requested.

One skilled in the art would not combine Roitman and Watanabe in reaching the claimed subject matter as Watanabe merely teaches applying the adhesive through an opening in the screen 24 and then removing the screen to leave the adhesive at the point of the opening. In other words, all that is disclosed in Watanabe is a method of applying an adhesive onto a flat surface through an opening in a screen. Thus, Watanabe does not provide for a mask-less grid which prevents glue from entering into a recess on the substrate. For at least these reasons, one skilled in the art would not combine Roitman and Watanabe in reaching the claimed subject matter, as the combination does not teach or suggest a mask-less grid which prevents glue from entering recesses.

Combination Does Not Teach or Suggest All Elements/Limitations

Assuming *arguendo* that one skilled in the art would attempt to combine the above references, the combination does not teach or suggest all the elements/limitations in Claims 1 and 13. The combination of references fail to teach or suggest a mask-less grid, as expressly recited in Claims 1 and 13. Additionally, the combination of references fail to teach or suggest grid having a plurality of uniformly spaced holes extending between a top side and a bottom side of the grid. Further, each of the uniformly spaced holes configured to accept a portion of glue having a dimension substantially equal to a width dimension of a smallest recess in the substrate. Considering that the combination of references do not teach or suggest each and every element/limitation in Claims 1 and 13, the claims are patentable. For at least these reasons, allowance of Claims 1 and 13 is respectfully requested.

Claim 1 recites, *inter alia*, placing a mask-less grid above the substrate, the mask-less grid having a plurality of uniformly spaced holes extending between a top side and a bottom side of the grid, each of the uniformly spaced holes configured to accept a portion of glue having a dimension substantially equal to a width dimension of a smallest recess in the substrate; and pressing a tool on the top side of the grid to locally bring the bottom side of the grid into contact with the substrate, wherein glue passing through the holes only deposit on the upper coplanar plane area without said glue entering into said recesses.

Claim 13 recites, *inter alia*, placing a mask-less grid above the substrate, the grid having a plurality of uniformly spaced holes of same width dimension, the holes extending between a top side and a bottom side of the grid, each of the width dimensions substantially equal to or smaller than a corresponding width dimension of a smallest recess in the substrate; pressing downward on the top side of the grid such that the bottom side comes locally into contact with the substrate such that glue is deposited only on the upper coplanar plane areas; and removing

the grid from the upper coplanar plane areas, wherein the glue does not enter any of the recesses.

Applicants respectfully argue that none of the cited references teach or suggest the above cited limitations. For at least these reasons, the Claims 1 and 13 are non-obvious over the cited art, and Applicants respectfully request withdrawal of the rejection. The dependent claims rejected under this paragraph are also allowable for being based on allowable base claims, and allowance of the dependent claims is respectfully requested.

Second Rejection under 35 U.S.C. § 103

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Roitman and Khan, Chen, or Watanabe as applied to claims 1-4 and 10-14 above, and further in view of U.S. Patent Application Publication No. 2005/0077175 to Eisenbeiss et al. (hereinafter “Eisenbeiss”). This rejection is respectfully traversed. The dependent claims rejected under this paragraph are also allowable for being based on allowable base Claims 1 and 13 as discussed above, and allowance of the dependent claims is respectfully requested.

Third Rejection under 35 U.S.C. § 103

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Roitman and Khan, Chen, or Watanabe as applied to claims 1-4 and 10-14 above, and further in view of U.S. Patent No. 6,176,962 to Soane et al. (hereinafter “Soane”). This rejection is respectfully traversed. The dependent claim rejected under this paragraph is also allowable for being based on allowable base Claim 1 as discussed above, and allowance of the dependent claim is respectfully requested.

Fourth Rejection under 35 U.S.C. § 103

Claims 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Roitman and Khan, Chen, or Watanabe as applied to claims 1-4 and 10-14 above, and further in view of U.S. Patent No. 5,932,315 to Lum et al. (hereinafter “Lum”). This rejection is respectfully traversed. The dependent claims rejected under this paragraph are also allowable for being based on allowable base Claims 1 and 13 as discussed above, and allowance of the dependent claims is respectfully requested.

New Claims

The Applicants have added new Claims 16-19 to the present application. The Applicants believes that New claims are fully supported by the specification and no new matter has been added.

Claims 17 and 18 are dependent claims, and Claim 19 is an independent claims. Claim 19 recites a method for assembling at least one micro-structured substrate having an upper coplanar plane area and a recess adjacent to the upper coplanar plane area, the method comprising: placing a mask-less grid above the substrate, the grid having a plurality of uniformly spaced holes of a same width dimension, the holes extending between a top side and a bottom side of the grid, wherein no hole is larger than any recess in the substrate; placing glue on the top side of the grid; and pressing downward on the top side of the grid such that the bottom side comes locally into contact with the substrate such that glue is deposited only on the upper coplanar plane areas and no glue enters any of the recesses. As stated above, Applicants respectfully submits that none of the references teach or suggest each and every

element/limitation in Claim 19. Accordingly, the new claims are allowable.

Conclusion

It is believed that this reply places the above-identified patent application into condition for allowance. Early favorable consideration of this reply is earnestly solicited.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-3557. A Request for Continued Examination (RCE) accompanies this Reply.

Respectfully submitted,

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